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Please register using the two simple steps below:

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2. Register for Epi-Tech Surveillance Training series:

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If you have any questions contact the DCO help desk

at: [usarmy.apg.medcomphc.mbx.diseaseepidemiologyprogram13@mail.mil](mailto:usarmy.apg.medcomphc.mbx.diseaseepidemiologyprogram13@mail.mil)



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# Laboratory Interpretation of Case Definitions

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# Debunking Laboratory Jargon



EIA

PCR

Ab

ELISA

Ag

IgM



IgG

RT-PCR



# Format



- The lab test
- What to look for in AHLTA
- How to report in DRSi



# 2012 Armed Forces Guidelines



All laboratory tests and case definitions in this presentation come from the 2012 Guidelines

**ARMED FORCES  
REPORTABLE MEDICAL EVENTS  
GUIDELINES  
&  
CASE DEFINITIONS**

Functional Proponent:  
Armed Forces Health Surveillance Center  
(AFHSC)  
March 2012

Prepared in collaboration with:  
U.S. Air Force School of Aerospace Medicine  
U.S. Army Public Health Command – Army Institute of Public Health  
U.S. Navy and Marine Corps Public Health Center

## How to get a copy:

- **Army:** <http://phc.amedd.army.mil/TOPICS/HEALTHSURV/DE/Pages/DRSiResources.aspx>
- **Navy:** <http://www.med.navy.mil/sites/nmcphc/program-and-policy-support/disease-surveillance/Pages/default.aspx>
- **AF:** <https://gumbo2.area52.afnoapps.usaf.mil/epi-consult/reportableevents/>
- **AFHSC:** <https://www.afhsc.mil/Home/ReportableEvents>

# Laboratory Language



- IgM vs. IgG
- 4-fold rise = acute and convalescent = paired sera
- Titer
- EIA/ELISA
- 2-tiered testing
- Seroconversion
- Rapid Flu test
- PCR vs. RT-PCR
- Novel flu labs
- Isolation = culture
- Smear = microscopy = slide
- HIV

# IgM vs. IgG

## Ig=Immunoglobulin

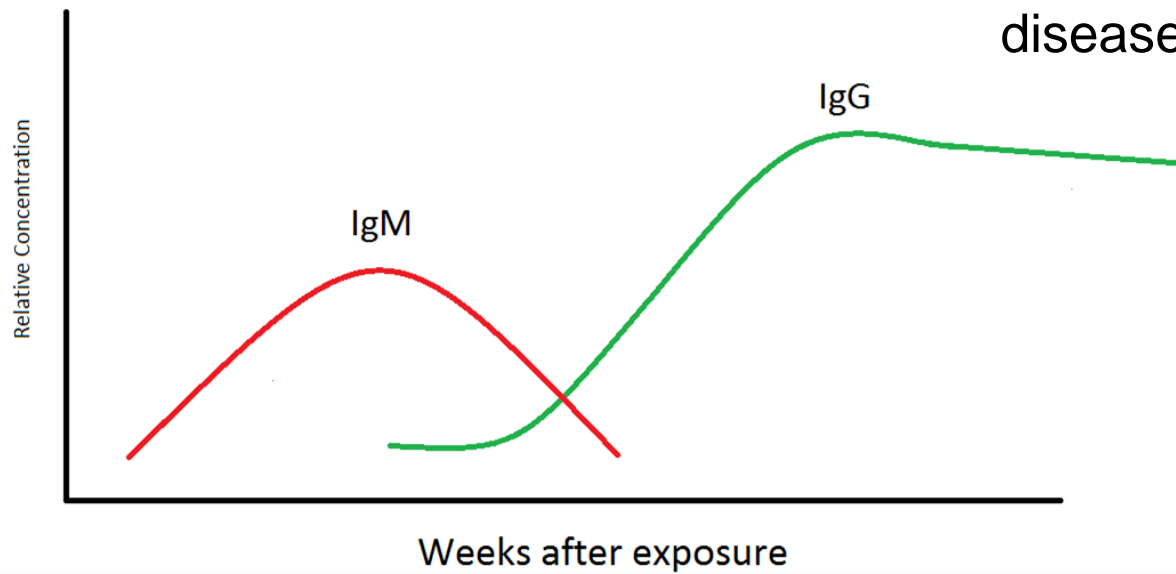


### ■ IgM Antibody

- Produced **first** in response to infection
- Marker of current infection
- Detectable only about 2-6 months

### ■ IgG Antibody

- Produced **later** in response to infection
- Marker of long-term immunity
  - from vaccination or disease



# IgM and IgG Example: Hepatitis A Labs

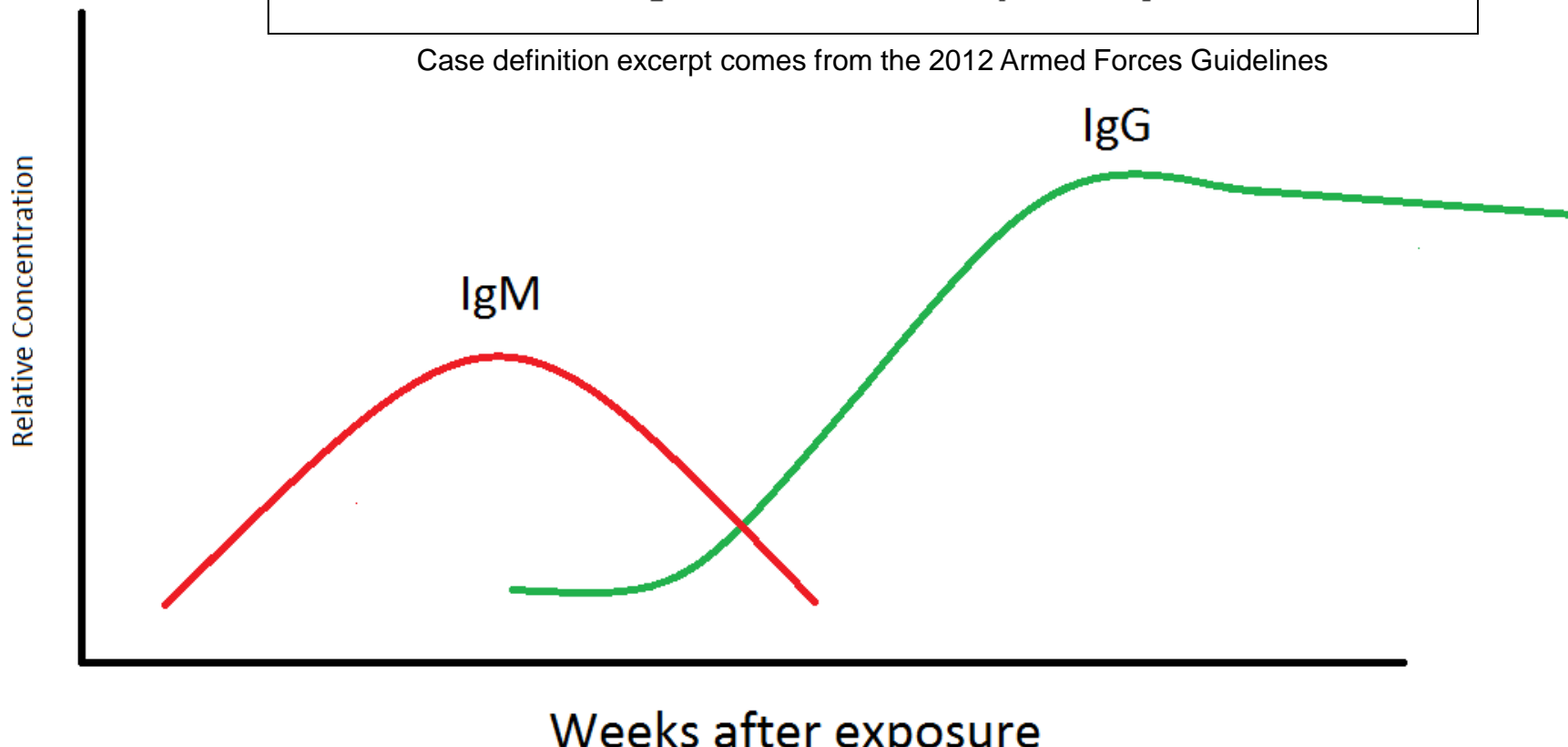


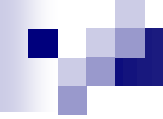
## Laboratory Criteria for Diagnosis

Any of the following:

- IgM antibody to hepatitis A virus (anti-HAV) positive, or
- Fourfold or greater rise in antibody titer in paired sera.

Case definition excerpt comes from the 2012 Armed Forces Guidelines





# Hepatitis A Lab Results in AHLTA



## Hepatitis A Virus Ab Total: Positive

Hep A Virus total antibody is positive  
(Total antibody includes IgG and IgM)

This would not meet the case definition



# Hepatitis A Lab Results in AHLTA



**Hepatitis A Virus Ab Total: Positive**  
**Hepatitis A Virus Ab IgM: Equivocal**

**This would not be reportable.**



# Hepatitis A Lab Results in AHLTA



## Hepatitis A Virus Ab IgM: Positive

This would be reportable  
so long as the rest of the case definition has been met:

## 5.24 HEPATITIS A

### Clinical Description

---

Reference 1

A viral disease with abrupt onset of fever, malaise (i.e. general discomfort or uneasiness), anorexia, nausea and abdominal discomfort, followed within a few days by jaundice and/or elevation of serum aminotransferase levels (AST/ALT). Severity ranges from asymptomatic to severe, generally increasing with patient age.

### Laboratory Criteria for Diagnosis

---

Any of the following:

- IgM antibody to hepatitis A virus (anti-HAV) positive, or
- Fourfold or greater rise in antibody titer in paired sera.

### Case Classification

---

*Confirmed:*

- A clinically compatible case that is laboratory-confirmed;
- A clinically compatible case that occurs in a person who has an epidemiologic link to a person who has laboratory-confirmed hepatitis A (i.e., household or sexual contact with an infected person during the 15-50 days before the onset of symptoms).

### Required Comments

---

Include the patient's hepatitis A immunization history.

### Additional Considerations

---

Document whether patient is food handler, a day care provider, or is an employee at a long term care facility. Also document relevant travel/deployment history (Note: the incubation period of hepatitis A is usually 28-30 days, with a range of 15-50 days).

Case definition excerpt comes from the 2012 Armed Forces Guidelines

**Need to be symptomatic**



# DRSi: Hepatitis A



## Medical Event

Diagnosis (ICD-9 code)

Hepatitis A

Date of Onset

Pick Date

Reporting Unit

Method of Confirmation

Biopsy  
Slide  
Serology  
Culture  
Clinical  
Other

Case Status

Confirmed  
Suspect  
Probable  
Not a Case  
Pending

MER Status

Date of Report

8/6/2014

Cases are suspected, confirmed, or probable according to the current Triservice Guidelines [Triservice Guidelines](#).

## Laboratory Tests

IgM antibody to Hepatitis A virus (anti-HAV)

☒ Positive ☐ Pending ☐ Negative

4-fold rise in antibody titer with paired sera

☐ Positive ☐ Pending ☐ Negative

Other labs not listed

## Event Related Questions

Vaccine history: has the patient been vaccinated against hepatitis A?

☐ Yes ☐ No

# 4-fold rise in serum antibody titer



## Laboratory Criteria for Diagnosis

Any of the following:

- IgM antibody to hepatitis A virus (anti-HAV) positive, or
- **Fourfold or greater rise in antibody titer in paired sera.**

Case definition excerpt comes from the 2012 Armed Forces Guidelines

**4-fold = acute and convalescent = paired sera**

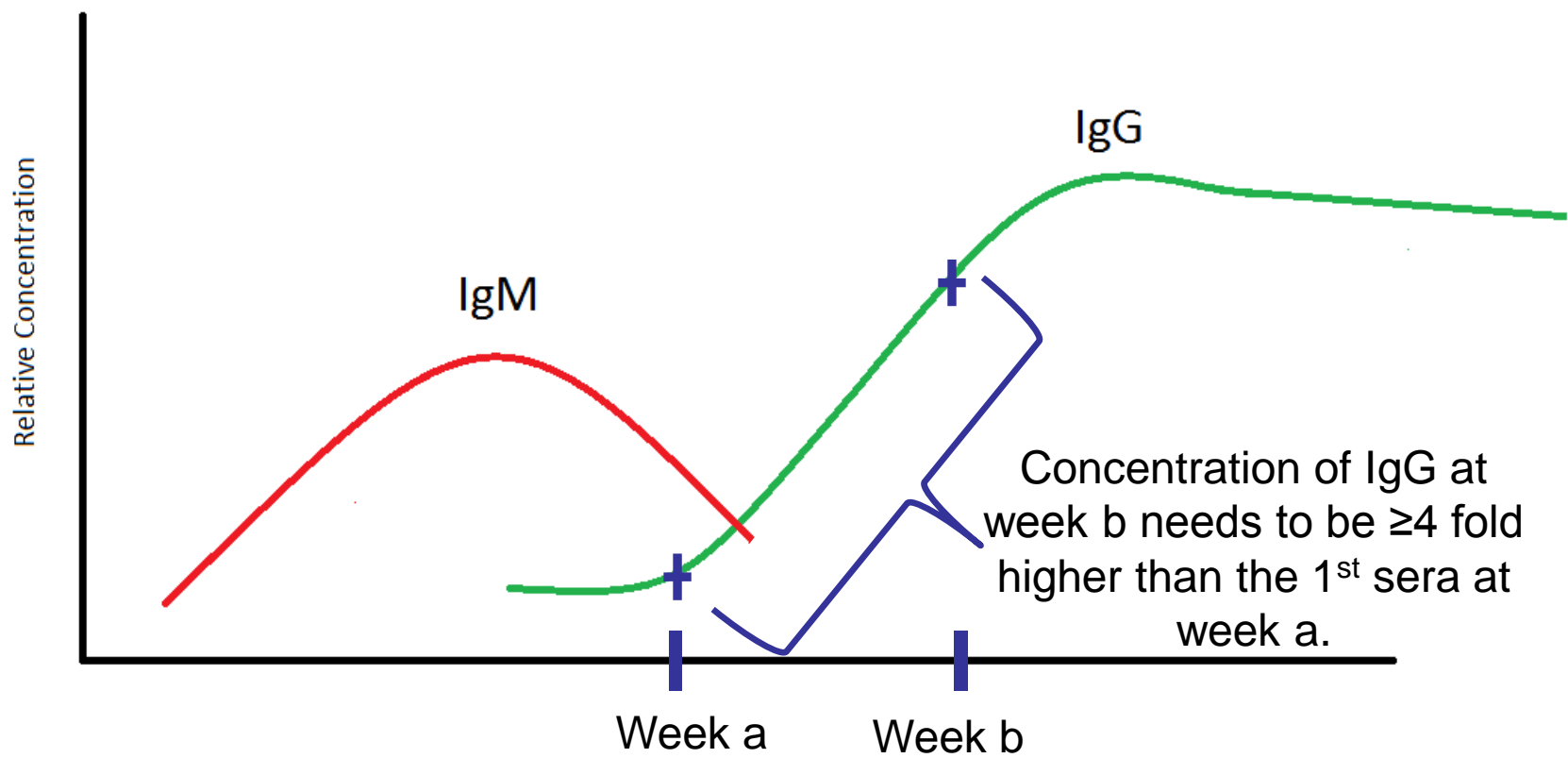
**4-fold** = concentration (titer) of IgG in the 2<sup>nd</sup> sera (convalescent) needs to be  $\geq 4$  fold higher than in the 1<sup>st</sup> sera (acute).

**Titer** = measurement indicating concentration of antibodies (IgG) as performed by serial dilutions

**Paired** = 2 samples

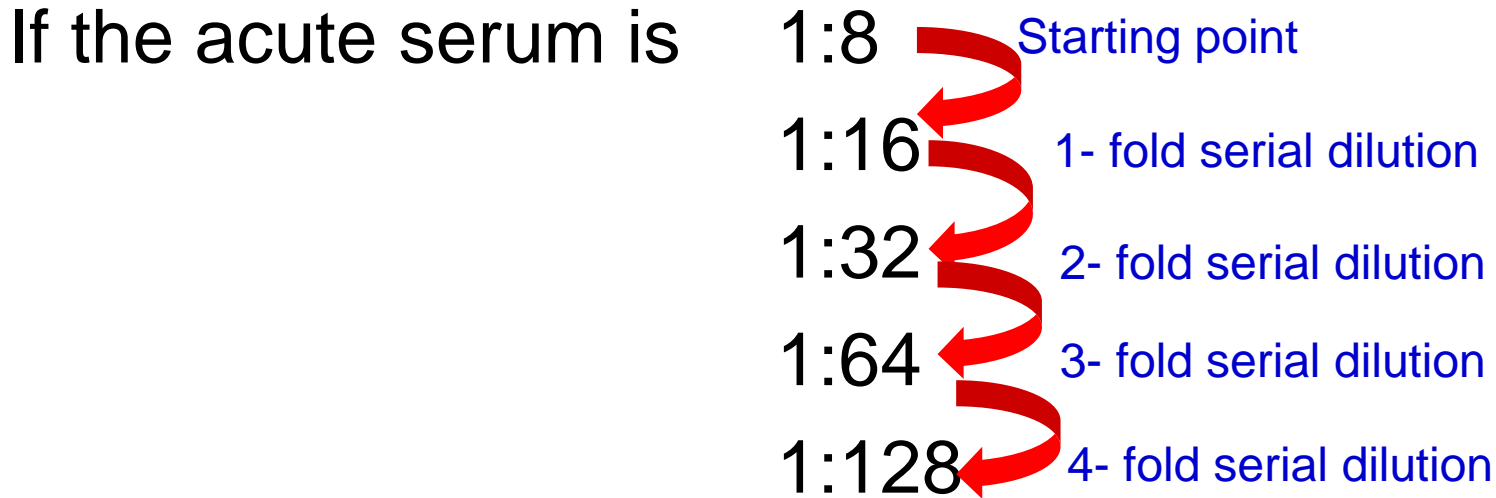
**A single serology DOES NOT count**

# 4-fold picture





# 4-fold math



Then the convalescent serum must be at least 1:128 to meet the 4-fold definition.

These are serial dilutions: if pos at a higher titer, it means antibody is still detectable at a higher dilution so you have more antibody



# 4-fold rise in serum antibody titer

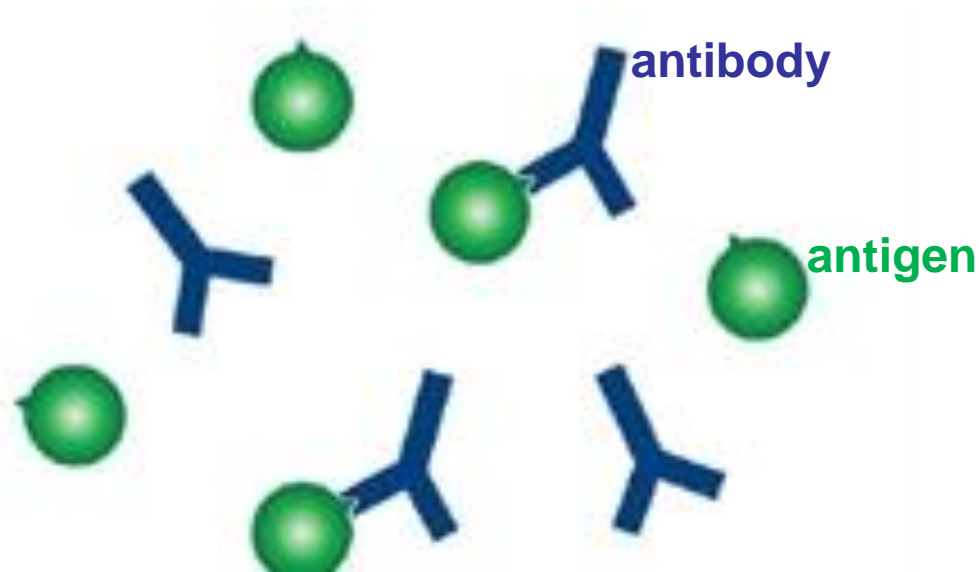


- Note in the above example:
  - AHLTA will only report out the titers
  - You have to do the math to know if there is a 4-fold increase
  
- 2 serologies separated by @ least 2 weeks
  - Some case definitions require @ least 3 weeks
  
- Not done frequently
  - MD's don't want to wait

# Measuring antibody concentration: EIA / ELISA



- EIA = Enzyme immunoassay
- ELISA (a type of EIA) = Enzyme linked immunosorbent assay
- Test detects antigen from the organism or antibody (IgG or IgM) against the organism



# Measuring antibody concentration: EIA / ELISA



- For the Campy example, this EIA is detecting *Campylobacter* antigen
  - found in stool

Laboratory Criteria for Diagnosis
Any of the following: <ul style="list-style-type: none"><li>• Isolation of <i>Campylobacter jejuni</i> from any clinical specimen, or</li><li>• EIA for antigen in stool.</li></ul>



Case definition excerpt comes from the 2012 Armed Forces Guidelines

# Measuring antibody concentration: EIA / ELISA



- For the Coccidioidomycosis example, the EIA is detecting IgM or IgG antibodies against the organism
  - found in any body fluid.

## Laboratory Criteria for Diagnosis

Any of the following:

- 
- 
- Positive serologic test for coccidioidal antibodies in serum or cerebrospinal fluid, or other body fluids by any of the following:
  - Detection of coccidioidal immunoglobulin M (IgM) by immunodiffusion, enzyme immunoassay (EIA), latex agglutination, or tube precipitin, or
  - Detection of coccidioidal immunoglobulin G (IgG) by immunodiffusion, EIA, or complement fixation.

# EIA / ELISA



**Back to Hep A**  
Both of these  
could be  
performed  
through EIA's.

## Laboratory Criteria for Diagnosis

Any of the following:

- IgM antibody to hepatitis A virus (anti-HAV) positive, or
- Fourfold or greater rise in antibody titer in paired sera.

Case definition excerpt comes from the 2012 Armed Forces Guidelines

The trick with the case definitions:  
sometimes the laboratory method is  
specifically named, and sometimes not.

# 2-tiered testing: Lyme disease



## 2 tiered testing $\neq$ paired sera

### Laboratory Criteria for Diagnosis

Any of the following:

For the purposes of surveillance, the definition of a qualified laboratory assay is

- Positive Culture for *B. burgdorferi*;
- Two-tier testing interpreted using established criteria [1], where:
  - Positive IgM is sufficient only when  $\leq 30$  days from symptom onset
  - Positive IgG is sufficient at any point during illness
- Single-tier IgG immunoblot seropositivity using established criteria [1-4]; or
- CSF antibody positive for *B. burgdorferi* by Enzyme Immunoassay (EIA) or Immunofluorescence Assay (IFA), when the titer is higher than it was in serum.

Case definition excerpt comes from the  
2012 Armed Forces Guidelines

■ 1<sup>st</sup> tier: EIA or IFA

■ If positive/equivocal, then 2<sup>nd</sup> tier: IgM or IgG  
Western Blot

- Centers for Disease Control and Prevention. Recommendations for test performance and interpretation from the Second National Conference on Serologic Diagnosis of Lyme Disease. MMWR MMWR Morb Mortal Wkly Rep 1995; 44:590–1.

Medical Event

Diagnosis (ICD-9 code)

Lyme Disease

Reporting Unit

Method of Confirmation

Case Status

MER Status

Case Status should be classified as suspect, probable or confirmed according to the current Triservice

Laboratory Tests

CSF antibody by EIA or IFA

Single-tier IgG immunoblot

Two-tier IgM/IgG testing

Isolation of Borrelia burgdorferi

Other labs not listed

Event Related Questions

Was this exposure duty related?

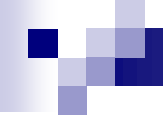
Is the patient experiencing late clinical manifestations?

Is there a documented Erythema Migrans skin lesion?

Is there a documented tick bite?



DRSi: Lyme



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# Seroconversion



- **Sero:** root word is “serum”
  - So looking for IgM or IgG in serum
- **Conversion:** changing from 1 form to another
- Converting from negative IgM to positive IgM
  - or from negative IgG to positive IgG
- Still need to find 2 serologies in AHLTA
  - Single serologies do not count

# Seroconversion: Examples of Case Definitions

## ■ Dengue

- Seroconversion from negative for dengue virus-specific serum Immunoglobulin M (IgM) antibody in an acute phase ( $\leq 5$  days after symptom onset) specimen to positive for dengue-specific serum IgM antibodies in a convalescent-phase specimen collected  $\geq 5$  days after symptom onset;

Case definition excerpt comes from the 2012 Armed Forces Guidelines

- Translation: Seroconversion from a negative IgM in an acute sera to pos IgM in convalescent sera

## ■ Mumps

- Demonstration of specific mumps antibody response in absence of recent vaccination, either a four-fold increase in IgG titer as measured by quantitative assays, or a seroconversion from negative to positive using a standard serologic assay of paired acute and convalescent serum specimens.

Case definition excerpt come from the 2012 Armed Forces Guidelines

- Translation: Seroconversion from negative IgG to positive IgG in acute and convalescent serum



## Medical Event

Diagnosis (ICD-9 code)

Dengue Fever

Reporting Unit

Method of Confirmation

Case Status

Case Status should be classified as suspect, probable or confirmed according to the following criteria:

# DRSi: Dengue seroconversion

## Laboratory Tests

IgM seroconversion

☐ Positive ☐ Pending ☐ Negative

IgM antibodies in serum with P/N ratio  $\geq 2$

☐ Positive ☐ Pending ☐ Negative

IgM antibodies in CSF

☐ Positive ☐ Pending ☐ Negative

4-fold rise in PRNT end point titer

☐ Positive ☐ Pending ☐ Negative

4-fold rise in IgG antibody titer

☐ Positive ☐ Pending ☐ Negative

Isolation of virus

☐ Positive ☐ Pending ☐ Negative

Other labs not listed



# Influenza



## Laboratory Criteria for Diagnosis

---

Any of the following:

Probable:

- Commercial influenza diagnostic rapid antigen test (RAT) of respiratory specimens.

Confirmed:

- Detection of influenza-specific RNA by RT-PCR testing of respiratory specimens;
- Influenza virus isolation in tissue cell culture from respiratory specimens;
- Direct antigen detection by immunofluorescent antibody (IFA) staining (direct or indirect) of respiratory specimens;
- Antigen detection by immunohistochemical (IHC) staining for influenza viral antigens in respiratory tract or other tissue from biopsy or autopsy specimens; or
- Four-fold rise in influenza hemagglutination inhibition (HI) antibody titer in paired acute and convalescent sera.

## Case Classification

---

**Probable:** A hospitalization for acute illness associated with a diagnosis of influenza with a positive result from a rapid antigen test (RAT). A confirmatory test should be ordered following a positive RAT.

**Confirmed:** A hospitalization for acute illness associated with a diagnosis of influenza and confirmed by an appropriate laboratory test as defined above.

*Note: For all confirmed cases a nasal wash specimen should be submitted to an appropriate laboratory for further influenza laboratory testing (i.e., gene sequencing).*

## Required Comments

Case definition excerpt comes from the 2012 Armed Forces Guidelines



# Influenza Lab Results in AHLTA



## Influenza A+B Virus Ag

- Rarely does AHLTA use the word “rapid”
- Most of the time, it will say just “Ag”.
- It’s detecting flu Antigen.
- “Ag” your tip off that this is a rapid *antigen* test (RAT).



# Influenza Lab Results in AHLTA



## **Influenza A+B Virus Ag**

Influenza Virus A Ag: Positive

Influenza Virus B Ag: Negative

This person has Flu A, as performed by a rapid test

## Clinical Case Definition

An illness compatible with influenza virus infection (fever  $\geq 100.5^{\circ}\text{F}$  accompanied by cough or sore throat in the absence of other diagnoses) in individuals < 65 years of age that results in hospitalization.

AND

Laboratory test confirmation or positive rapid test result supporting influenza diagnosis obtained less than 4 days after hospital admission (to minimize the reporting of nosocomial [hospital acquired] rather than community acquired infections).

### Comment

Hospitalization is defined as an admission to an inpatient ward of a hospital, or a medical transfer or evacuation to a facility with a higher level of care. Patients admitted for observation and discharged the same day are considered hospitalized for this case definition. An overnight stay is not required. Emergency room or outpatient clinic visits that do not result in hospital admission are not considered hospitalizations.

Case definition excerpt comes from the 2012 Armed Forces Guidelines



Hospitalization =  
admission

Before reporting in DRSi, also check to make sure person is <65 yrs of age and hospitalized.

**Only report flu if the patient is hospitalized and under 65 yrs of age.**

Medical Event

Diagnosis (ICD-9 code)

Influenza-Associated Hospitalization

Reporting Unit

Method of Confirmation

Biopsy

Slide

Serology

Culture

Clinical

Other

Case Status

Confirmed

Suspect

Probable

Not a Case

Pending

Case is suspect,

Case Status should be classified as suspect, probable or confirmed according

Laboratory Tests

Rapid Antigen Test

☒ Positive ☐ Pending ☐ Negative

Antigen detection by immunohistochemical staining (IHC)

☐ Positive ☐ Pending ☐ Negative

4-fold rise in influenza HI antibody titer

☐ Positive ☐ Pending ☐ Negative

PCR

☐ Positive ☐ Pending ☐ Negative

Isolation of virus

☐ Positive ☐ Pending ☐ Negative

Other labs not listed



# Reporting this patient

The underlying method of the rapid test is antibody/antigen detection (EIA) which is a serologic test



# AHLTA: Different Flu Patient



## Respiratory Virus Panel

Respiratory Viral Culture: Influenza Virus Type A

Influenza Virus A+B DNA: 2009 Influenza A(H1N1)

- In this case a Respiratory Virus Panel includes Culture and DNA (AHLTA really means RNA)
- Both are positive
  - ☐ Culture has identified the type: Flu A
  - ☐ DNA has identified the subtype: A(H1N1)
- Our patient has Flu A, specifically A(H1N1)

## Laboratory Criteria for Diagnosis

---

Any of the following:

Probable:

- Commercial influenza diagnostic rapid antigen test (RAT) of respiratory specimens.

Confirmed:

- Detection of influenza-specific **RNA** by RT-PCR testing of respiratory specimens;

Case definition excerpt comes from the 2012 Armed Forces Guidelines

### ■ When the case definition says

- ...“Detection of influenza-specific **RNA**”

### ■ And AHLTA says “Influenza Virus A+B **DNA**”

- ...for the purposes of meeting the case definition, they’re the same thing.

## Laboratory Criteria for Diagnosis

---

Any of the following:

Probable:

- Commercial influenza diagnostic rapid antigen test (RAT) of respiratory specimens.

Confirmed:

- Detection of influenza-specific RNA by RT-PCR testing of respiratory specimens;

Case definition excerpt comes from the 2012 Armed Forces Guidelines

### ■ When the case definition says

- ...“Detection.....by RT-PCR ”

### ■ And AHLTA says “Influenza Panel PCR”

- ...for the purposes of meeting the case definition, they’re the same thing.



# Each MTF has a different way of reporting out results



- AHLTA is designed differently at every MTF
- Talk to your lab people to find out how they code their tests and their results
- Also note: some positive results are in red, some are not – don't get fooled!



**Reporting  
this  
patient**

<b>Medical Event</b>
<b>Diagnosis (ICD-9 code)</b>
Influenza-Associated Hospitalization
<b>Reporting Unit</b>

<b>Method of Confirmation</b>	<b>Case Status</b>
<div>Biopsy Slide Serology <b>Culture</b> Clinical Other</div>	<div><b>Confirmed</b> Suspect Probable Not a Case Pending</div>

Cas is suspect,

Case Status should be classified as suspect, probable or confirmed according

## Laboratory Tests

### Rapid Antigen Test

☐ Positive ☐ Pending ☐ Negative

### Antigen detection by immunohistochemical staining (IHC)

☐ Positive ☐ Pending ☐ Negative

### 4-fold rise in influenza HI antibody titer

☐ Positive ☐ Pending ☐ Negative

### PCR

☒ Positive ☐ Pending ☐ Negative

### Isolation of virus

☒ Positive ☐ Pending ☐ Negative

### Other labs not listed

Diagnosis (ICD-9 code)

Influenza, Novel

Reporting Unit

Method of Confirmation

Culture

Case Status

Confirmed

MER Status

Final

First Reported Date (mm/dd/yyyy):

12/3/2014

Original Reporting Unit:

Case Status should be classified as suspect, probable or confirmed according to the current Tr

### Laboratory Tests

Rapid Antigen Test

☒ Positive ☐ Pending ☐ Negative

Antigen detection by immunohistochemical staining (IHC)

☒ Positive ☐ Pending ☐ Negative

4-fold rise in influenza HI antibody titer

☒ Positive ☐ Pending ☐ Negative

PCR

☒ Positive ☐ Pending ☐ Negative

Isolation of virus

☒ Positive ☐ Pending ☐ Negative

Other labs not listed



We do not want you to report like this.

Once a lab test is selected, it can not be de-selected.

Have to delete the record and start a new DRSi report.

## Event Related Questions

**Vaccine history: Has the patient been vaccinated against influenza?**

☒ Yes ☐ No

**if vaccine was given, please indicate which one was given**

☐ Shot (TIV) ☒ Nasal Mist (LAIV)

**If vaccine was given, please provide date of vaccine**

10/01/2014

**Was the patient hospitalized?**

☐ Yes ☒ No

**Date of hospital admission**

**Place of hospital admission**

**Please select all underlying conditions and additional/concurrent diagnoses (use ctrl-key to click all that apply)**

Pneumonia, Bacterial  
Pneumonia , Viral  
Acute Respiratory Distress Syndrome  
Asthma/COPD

**Please specify the virus type.**

Type A ▾

**Did the patient expire?**

☐ Yes ☒ No

**Date the patient expired:**

**Influenza subtype**

H3

**Pertinent travel?**

☐ Yes ☒ No

**If there was pertinent travel, please select the countries of travel. (use ctrl-key to click all that apply)**

Afghanistan - AF  
Africa - XA  
Albania - AL  
Algeria - AG

## Comments

**Comments** (2,000 characters maximum)



# DRSi: How is this Influenza Report?

## Type in the chat box

## Diagnosis (ICD-9 code)

Influenza, Novel

## Reporting Unit

### Method of Confirmation

Culture

### Case Status

Confirmed

### First Reported Date (mm/dd/yyyy):

12/4/2014

### Original Reporting Unit:

Case Status should be classified as suspect, probable or confirmed according

## Laboratory Tests

### Rapid Antigen Test

☒ Positive ☐ Pending ☐ Negative

### Antigen detection by immunohistochemical staining (IHC)

☐ Positive ☐ Pending ☐ Negative

### 4-fold rise in influenza HI antibody titer

☐ Positive ☐ Pending ☐ Negative

### PCR

☐ Positive ☐ Pending ☐ Negative

### Isolation of virus

☐ Positive ☐ Pending ☐ Negative



**DRSi: How is this report?**

Type in the chat box

Method of Confirmation	Case Status
<input type="text"/>	<input type="text"/>
Biopsy	Confirmed
Slide	Suspect
Serology	Probable
Culture	Not a Case
Clinical	Pending
Other	

Method of  
confirmation

Case  
(classification)  
status

Laboratory criteria

Laboratory Tests	
Stool culture	<input type="radio"/> Positive <input type="radio"/> Pending <input type="radio"/> Negative
Blood Culture	<input type="radio"/> Positive <input type="radio"/> Pending <input type="radio"/> Negative
Other labs not listed	<input type="text"/>

Before submitting all DRSi reports, please make sure that **Method of Confirmation**, **Case (classification) status**, and **Lab criteria** are congruent with each other as well as the case definition.



# What's in a Name: Novel Flu



- A new flu virus
- Has never circulated in humans before
- Therefore:
  - ☐ No immunity
  - ☐ No vaccine
  - ☐ Could cause high morbidity/mortality
  - ☐ Rampant transmission: Global pandemic
- Though it shares the same name, it is not the same thing as Seasonal Flu



[dartmed.dartmouth.edu](http://dartmed.dartmouth.edu)

**Novel flu ≠ Seasonal flu**

**Novel flu ≠ New flu diagnosis in a patient**



# If there were sustained novel flu transmission, there would be a global *crisis*



- WHO would declare an emergency of international concern
- Markets would shut down
- Panic would be rampant
- Would be all over media outlets
- It is a BIG deal



The New York Times



**If the physician's diagnosis says:**

"Influenza due to identified novel influenza A virus with other respiratory manifestations"

**And AHLTA says:**

Influenza Virus A+B Virus Ag: Influenza Virus A

**Do Not Report This as Novel Flu**  
(The only way to identify novel flu is through PCR)



# Reporting Novel Flu Generates Command Level Attention



- Don't report it
  - (unless you are told to report it that way by your chain of command.)
- H1N1 is no longer novel
  - In 2009 it was novel, but it no longer is.
- H3N2 is NOT novel
  - (H3N2)v is novel
  - Don't confuse the two
- If you have question about novel flu, call your service hub or the USAFSAM Epi lab.



# What's in a name: H. flu

*Haemophilus influenza* (H. flu)  
(a bacteria)

≠

Influenza (Flu)  
(a virus)

# Isolation = Culture

- Regardless if referring to bacteria or virus.

Confirmed:

- Detection of influenza-specific RNA by RT-PCR testing of respiratory specimens;
- Influenza virus isolation in tissue cell culture from respiratory specimens;

Case definition excerpt comes from the 2012 Armed Forces Guidelines

## Laboratory Criteria for Diagnosis

Any of the following:

- Isolation of *Campylobacter jejuni* from any clinical specimen, or

Case definition excerpt comes from the 2012 Armed Forces Guidelines

In AHLTA you will not see the word “isolation”.  
You will see “culture”. They are synonymous



# Reporting Campy



## Medical Event

Diagnosis (ICD-9 code)

Campylobacter Infection

Date of Onset

Pick Date

Reporting Unit

Method of Confirmation

Biopsy  
Slide  
Serology  
Culture  
Clinical  
Other

Case Status

Confirmed  
Suspect  
Probable  
Not a Case  
Pending

MER Status

Date of Report

8/6/2014

Case is suspect,

according to the current Triservice Guidelines

## Laboratory Tests

Isolation of agent

☒ Positive ☐ Pending ☐ Negative

EIA for antigen in stool

☐ Positive ☐ Pending ☐ Negative

Other labs not listed

## Event Related Questions

Please specify the species of agent if possible.



DEPARTMENT OF DEFENSE (AFHSC)  
Detecting and Reporting DoD Cases of Chikungunya Infection:  
Guidance as of 25 JUL 2014



### 1. Diagnosis:

- Consider chikungunya virus infection in patients with acute onset of fever and polyarthralgia, especially travelers who have returned within two weeks from [areas with virus transmission \(CDC\)](#). Preliminary diagnosis should be based on the patient's clinical features, activities, as well as places and dates of travel.
- Check for dengue. [Proper treatment of dengue \(WHO guidelines\)](#) can improve outcomes. Dengue and chikungunya viruses are transmitted by the same mosquitoes and have similar clinical features. The two viruses often circulate in the same area and can cause occasional co-infections in the same patient. Chikungunya virus infection is more likely to cause high fever, severe arthralgia, arthritis, rash, and lymphopenia, while dengue virus infection is more likely to cause neutropenia, thrombocytopenia, hemorrhage, shock, and death. Co-infections may include any of these symptoms.
- Differential diagnoses include leptospirosis, malaria, rickettsia, group A streptococcus, rubella, measles, parvovirus, enteroviruses, adenoviruses (e.g. Mayaro), post-infection arthritis, and rheumatologic conditions.

### 2. Clinical Diagnostic Testing:

- USAMRIID Special Pathogens Laboratory (SPL)  
[usarmy.de.trick.medcom-usamriid.mbx.special-pathogens-lab@mail.mil](mailto:usarmy.de.trick.medcom-usamriid.mbx.special-pathogens-lab@mail.mil)  
301-619-3318 (DSN 343)  
For sample submission please use the [SPL Form](#).
- NMRC Navy Infectious Disease Diagnostic Laboratory (NIDDL)  
LCDR. Todd Myers  
[todd.myers@med.navy.mil](mailto:todd.myers@med.navy.mil)  
301-319-7447 (DSN 285)

If a non-DoD lab is used, saving an aliquot of refrigerated serum for DoD lab characterization is highly recommended.

### 3. Reporting:

- Confirmed cases of chikungunya infection should be reported through the chain-of-command and the appropriate Service-specific public health POCs:
  - Navy [Environmental Preventive Medicine Unit](#) or Navy and Marine Corps Public Health Center Threat Assessment  
[threatassessment@med.navy.mil](mailto:threatassessment@med.navy.mil)  
757-953-0700 (DSN 377-0700)
  - U.S. Air Force School of Aerospace Medicine  
Epidemiology Consult Service  
[episeservices@wpafb.af.mil](mailto:episeservices@wpafb.af.mil)  
937-938-3207 (DSN 798-3207)
  - Army Institute of Public Health  
Disease Epidemiology Program

## Laboratory Criteria for Diagnosis

### Evaluate serum or plasma by:

- Viral culture to detect virus in first 3 days of illness; or
- RT-PCR to detect viral RNA in first 8 days of illness; or
- Serology to detect IgM, IgG, and neutralizing antibodies that develop toward the end of the first week of illness ( $\geq 4$  days post illness onset)

# New in DRSi: Chikungunya



- Only report Confirmed cases
- Case definition is located here:  
<https://www.afhsc.mil/documents/pubs/documents/Detecting and Reporting DoD Cases of Chikungunya 25JUL2014.pdf>
- Air Force and Navy are using an updated draft case definition that includes laboratories:



# Chikungunya Lab Results in AHLTA



## Chikungunya virus Ab

Chikungunya virus IgG: Positive

Chikungunya virus IgM: Positive

### Laboratory Criteria for Diagnosis

Evaluate serum or plasma by:

- Viral culture to detect virus in first 3 days of illness; or
- RT-PCR to detect viral RNA in first 8 days of illness; or
- Serology to detect IgM, IgG, and neutralizing antibodies that develop toward the end of the first week of illness ( $\geq 4$  days post illness onset)



# New in DRSi: Chikungunya Page

## Medical Event

Diagnosis (ICD-9 code)

Chikungunya Fever

Date of Onset

Pick Date

Reporting Unit

Method of Confirmation

Case Status

IER Status

Date of Report

3/18/2015

No longer reportable as “Any other unusual condition not listed”

Case Status should be classified as suspect, probable or confirmed according to the current Triservice Guidelines [Triservice Guidelines](#).

## Laboratory Tests

Isolation of virus

☐ Positive ☐ Pending ☐ Negative

Detection of virus by RT-PCR

☐ Positive ☐ Pending ☐ Negative

Serology/Immunology (please specify in the comments section below)

☐ Positive ☐ Pending ☐ Negative

Other labs not listed

Name of lab performing the testing



# Smear = microscopy = slide = film



Method of Confirmation
Biopsy
Slide
Serology
Culture
Clinical
Other

## ■ Obvious case definition examples:

- ☐ Malaria (confirmed) – detection of malaria on **blood film**
- ☐ Gonorrhea
  - (confirmed): Observation of gram-negative intracellular diplococci in a **urethral smear** obtained from a male.
  - (probable): Demonstration of gram-negative intracellular diplococci in an **endocervical smear** obtained from a female



# Smear = microscopy = slide = film



Method of Confirmation
Biopsy
Slide
Serology
Culture
Clinical
Other

## ■ Not so obvious examples:

- TB (probable) – demonstration of acid fast bacillus in a clinical specimen
  - Look at the color of bacterial cell wall under the microscope
- Meningococcal Disease (suspected) – gram negative diplococci from sterile site
  - Look at color and shape of the bacteria under the microscope
- Giardia (confirmed): observation of cysts or trophozoites in stool

## Method of Confirmation

Biopsy
Slide
Serology
Culture
Clinical
Other

# Serology

 (serologic test method)

- Any EIA/ELISA test method
- Rapid flu test

## Clinical

- Things that don't require labs to confirm:
  - ☐ Any case definition that only requires sign/symptoms
    - Cold weather, heat illnesses, some definitions of Lyme, suspect measles

## Other

- Any genetic/DNA tests: PCR, RT-PCR, probe



**HIV/AIDS is not reportable to DRSi**



# DRSi Helpdesk e-mails



- **Navy and Air Force** (share the Navy DRSi Helpdesk)
  - [usn.hampton-roads.navmcpubhlthcenpors.list.nmcphc-ndrs@mail.mil](mailto:usn.hampton-roads.navmcpubhlthcenpors.list.nmcphc-ndrs@mail.mil)
  - **!This is a new address!**
- **Army DRSi Helpdesk:**
  - [usarmy.apg.medcom-phc.mbx.disease-epidemiologyprogram13@mail.mil](mailto:usarmy.apg.medcom-phc.mbx.disease-epidemiologyprogram13@mail.mil)
- Use these addresses to send your completed DD2875 forms
- Or for any technical DRSi issues
- Continue to reach out to your respective service hub for all other issues
  - (comm disease issues, outbreaks, case definition guidance, etc)



# Contact Information



- **Army:**      **USAPHC – Disease Epidemiology Program**  
Aberdeen Proving Ground – MD  
Comm: (410) 436-7605    DSN: 584-7605  
[usaphc.disease.epidemiology@us.army.mil](mailto:usaphc.disease.epidemiology@us.army.mil)
- **Air Force:**    **Contact your MAJCOM PH or USAFSAM/PHR**  
USAFSAM / PHR / Epidemiology Consult Service  
Wright-Patterson AFB, Ohio  
Comm: (937) 938-3207    DSN: 798-3207  
[episervices@wpafb.af.mil](mailto:episervices@wpafb.af.mil)



# Contact Information



## Navy:

### NMCPHC Preventive Medicine Department

- COMM: (757) 953-0700; DSN: (312) 377-0700
- Email: NMCPHCPTS-threatassessment@med.navy.mil

### Navy Environmental and Preventive Medicine Units (NEPMU)

- NEPMU2
  - COMM: (757) 953-6600; DSN: (312) 377-6600
  - Email: NEPMU2Norfolk-Threat-MedEpi@med.navy.mil
- NEPMU5
  - COMM: (619) 556-7070; DSN (312) 526-7070
  - Email: HealthSurveillance@med.navy.mil
- NEPMU6:
  - COMM: (808) 471-0237; DSN: (315) 471-0237
  - Email: usn.jbphh.navenpvntmedusixhi.list.nepmu6@mail.mil
- NEPMU7
  - COMM (international): 011-34-956-82-2230 (local: 727-2230); DSN: 94-314-727-2230
  - Email: NEPMU7@eu.navy.mil



# Conclusion



- Gone through case definitions from a laboratory perspective
- Understood laboratory terminology
- Reviewed DRSi reporting
- Moral of the story: if the case definitions change, the principles of how to read AHLTA or how to read a case definition do not.
- For more information on laboratory interpretation:
  - Talk to your lab officer
  - <http://labtestsonline.org/map/aindex/>



# Questions





# DCO Registration



Please register using the two simple steps below:

1. Log-in or create a CME account:

<https://tiny.army.mil/r/zB8A/CME>

**\*\*Tip:** If your facility is not listed as an option on the registration form, please select "OTHER/MEDCOM"

2. Register for Epi-Tech Surveillance Training series:

<https://tiny.army.mil/r/LEAid/EpiTechFY15>

If you have any questions contact the DCO help desk

at: [usarmy.apg.medcomphc.mbx.diseaseepidemiologyprogram13@mail.mil](mailto:usarmy.apg.medcomphc.mbx.diseaseepidemiologyprogram13@mail.mil)